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Selecting Western White Pine Leave-Trees

Leave-Tree

USDA Forest Service
Research Note INT-218
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BLISTER RUST CONTROL

White pine blister rust infects nearly all western white pine in Idaho, eastern Washington, and western Montana, and has killed up to 95 percent of the white pine in locations most favorable to the rust.

Presently, the only control available is to use blister rust-resistant planting stock. More than 300 pounds of sound seed has been produced at the Sandpoint seed orchard and Moscow arboretum through the 1976 seed year. All needs for resistant planting stock will soon be satisfied. But how can present stands be managed? It is desirable to leave some white pine in a stand because it may be the "best" tree for the site, and the progeny of the surviving trees will exhibit increased resistance to blister rust.

The probability of managers selecting the more resistant individuals to produce the next generation is very high if an exhaustive blister rust survey were completed for each stand. But a method that is less time consuming is needed. Since the amount of mortality varies directly with the amount of blister rust present and the rate of mortality varies indirectly with the age of the trees, several approaches are needed.

Young Stands (less than 30 years old)

Leave trees that have no stem cankers and relatively few branch cankers. Designate leave-trees after a rapid visual inspection at the site, without counting cankers.

Trees to be Removed

Pole Stands (30-60 years old)

Cankers in these stands are difficult to see, but the resistance in the stand has had many years to be expressed. Hence, we propose that selection of leave-trees be based solely on crown appearance.

Ignore blister rust stem cankers and branch flags, and leave-trees that have dense, luxuriant, grass-green foliage (see front and back panels of this note). Seven years' accumulation of data from stands in which nearly every tree of this type had cankers shows that these trees have a very low mortality probability (1.1 percent per year).

Trees to be removed exhibit a sparse, gray-green foliage and generally appear unthrifty. Seven years' accumulation of data shows that trees of this type exhibit a high probability of mortality (7.3 percent per year).

Mature Trees (more than 60 years old)

Trees in these stands have reached merchantable age. If the stand is to be regenerated by seed tree or shelterwood methods, leave disease-free, fast-growing, best-formed trees. Selection is most easily accomplished if it is done in two stages.

First, mark and remove all the obviously poor trees. Then, select the leave-trees from those remaining. Stands that have had 80-90 percent mortality should yield 20 percent resistant progeny. If the leave-trees are average seed producers, each tree will produce 335 established seedlings over a 5-year regeneration period, and if 10 white pine seed trees remain per acre, the new stand (3,350 trees per acre) can suffer 80 percent blister rust mortality and still be considered an established stand (670 trees per acre).

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